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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,739	07/11/2005	Werner Hinz	274092US0XPCT	3909
22850	7590	10/27/2006		EXAMINER
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			BOYKIN, TERRESA M	
			ART UNIT	PAPER NUMBER
			1711	

DATE MAILED: 10/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/541,739	HINZ ET AL.	
Examiner	Art Unit		
Terressa M. Boykin	1711		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 11 July 2005.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-40 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) Claim(s) _____ is/are allowed.
6) Claim(s) 1-40 is/are rejected.
7) Claim(s) _____ is/are objected to.
8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____.
4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
5) Notice of Informal Patent Application
6) Other: _____.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 40 are rejected under 35 U.S.C. 102(b) as being anticipated by USP 5523386 see abstract, cols. 1-4, Example 12, table 1, claims 1,2, and 4; USP 5688861 see cols. 1-10, tables I, II and III, and claims 1-13.

USP 5688861 discloses a polymer polyols and polymer-modified polyols having substantially no transition metal content in the polyol continuous phase may be prepared from encapsulative double metal cyanide complex-catalyzed polyoxyalkylene polyether base polyols without substantial removal of double metal cyanide complex catalyst residues from the base polyol and subsequent in situ polymerization of one or more polymerizable monomers.

The reference particularly discloses a process for the manufacture of polymer polyols by the in situ polymerization of vinyl monomers and to the manufacture of polymer-modified polyols by the in situ polymerization of polyisocyanates and isocyanate reactive monomers, both types of in situ polymerization conducted in the presence of a polyoxyalkylene polyether base polyol.

The reference acknowledges that the manufacture of polymer polyols is by now well known, and may involve batch, semi-batch, and fully continuous processes. The manufacture of polymer-modified polyols is also by now well known.

In both polymer polyols and polymer-modified polyols, the monomers are generally initially soluble in the polyol continuous phase, as are in general the initial low molecular

weight oligomers. However, as the molecular weight of the polymer phase grows, the polymer becomes insoluble, forming small particles which rapidly coalesce and/or agglomerate to larger particles in the submicron to several micron range. Hereinafter, the term "polymer polyol" refers to dispersions of vinyl polymers, "polymer-modified polyol" to polyurea, polyurethaneurea, or other isocyanate-derived polymer dispersions, and the term " polyol polymer dispersions" will refer to both of these collectively.

The base polyols used in preparing polyol polymer dispersions generally contain a high proportion of polyoxypropylene moieties. Polyoxypropylene polyether polyols are conventionally prepared by the base-catalyzed oxyalkylation of a suitably functional initiator molecule with propylene oxide or a mixture of propylene oxide and ethylene oxide.

The reference provides a method of preparing polyol polymer dispersions from double metal cyanide catalyzed polyoxypropylene polyether polyols without the necessity of removing or denaturing double metal cyanide complex catalyst residues, without such catalyst residues appearing in the continuous polyol phase of the polyol polymer dispersion which are white or off-white in color.

The reference discloses that polyol polymer dispersions may be prepared from certain double metal cyanide complex-catalyzed polyoxypropylene polyether polyols without removing the double metal cyanide complex catalyst residues, while obtaining polyol polymer dispersions containing only exceptionally low levels of catalyst residues in the continuous polyol portion of the polyol polymer dispersion.

The polyoxyalkylene polyols used as base polyols for the subsequent manufacture of polyol polymer dispersions include at least one polyoxyalkylene polyether polyol prepared by the polymerization of propylene oxide onto one or more initiator molecules of suitable functionality, optionally in conjunction with one or more alkylene oxides other than propylene oxide, in the presence of an encapsulative double metal cyanide

complex catalyst as hereinafter defined. The alkylene oxides other than propylene oxide which may optionally be used in conjunction with the latter include, but are not limited to, ethylene oxide, 1,2- and 2,3-butylene oxide, styrene oxide, C5-20 olefin oxides, epichlorohydrin, chlorinated butylene oxides, and the like.

Suitable oligomeric initiators may be prepared by conventional, base catalyzed oxyalkylation of monomeric initiators, or by catalysis with alternative catalysts such as diethylzinc, calcium naphthenate, and the like. The particular catalyst is not critical, however, when basic catalysts are used, the catalyst residues should be removed from the oligomeric initiator by conventional treatment prior to continued oxyalkylation employing double metal cyanide complex catalysts; otherwise, the latter may be inactivated. The oligomeric initiators may comprise monomeric initiators oxyalkylated with propylene oxide, mixtures of propylene oxide and ethylene oxide or another alkylene oxide, higher alkylene oxides, or all ethylene oxide. Preferable are oligomeric initiators prepared from all propylene oxide or mixtures of propylene oxide and ethylene oxide.

The oxyalkylation conditions for preparation of the base polyol are those conventionally used in double metal cyanide complex oxyalkylation. The initiator, preferably an oligomeric polyoxyalkylene polyol initiator, is charged to an agitated reactor, the double metal cyanide complex catalyst added, and the reactor purged with nitrogen.

Whether the initial transition metal content is high or low, it is lowered further by the process of the subject invention, provided that an encapsulative double metal cyanide complex catalyst is utilized. It is most surprising that under the same conditions, non-encapsulative double metal cyanide catalysts remain substantially in the continuous phase. The subject process allows encapsulative double metal cyanide complex catalyst residues to be simply left in the polyol without any post-treatment catalyst

removal, or post-treatment which removes only a portion of catalyst residues, for example a coarse, rapid filtration which by itself would not be suitable for purification of non-polymer, double metal cyanide complex catalyzed polyols.

With regard to the addition of adsorbent materials, the reference discloses that the polymerizable monomers preferentially polymerize on or proximate to the double metal cyanide complex residues, surrounding the residue with polymer, or that double metal cyanide complex particle residues serve as nucleation sites for polymer particle agglomeration or coagulation, or that the polymer particles or agglomerates serve as adsorber. sites for the catalyst residues.

With regard to the addition of an amine, the reference notes that ,with PIPA polyols, the isocyanate-reactive monomer, may be an amine or polyamine, which is added to the base polyol. For amines with low solubility, high speed stirring is used to form a fine dispersion. Isocyanate is then added slowly, during the course of which the temperature will rise. Following a period of time to allow for full reaction, a white, polyurea dispersion is obtained. The polymer particles incorporate a portion of the polyol continuous phase. Preferred diamines are hydrazine and ethylenediamine, although other diamines as well as hydrazides, are useful.

Lastly, the base polyols suitable for use in the process of the subject invention may contain from 4 ppm transition metal content to well over several hundred ppm transition metal content. Preferably, the base polyols contain from 4 ppm to 100 ppm, more preferably from 5 to 50 ppm, and most preferably, from 10-40 ppm transition metal content. Catalyst concentrations of 20 ppm or more relative to base polyol are the general rule, and quite suitable for use in the subject invention. Preferably, the base polyol is not treated to remove catalyst residues. The advantageous results of the subject process may also be characterized by the degree of catalyst removal from the base polyol into the dispersed polymer phase, regardless of the continuous phase

transition metal content. Preferably, 60% or more of the transition metal content of the base polyol is partitioned into the dispersed polymer phase, more preferably 75% or more, and most preferably about 90% or more on a weight basis. Both a high of percentage partitioning and minimal continuous phase transition metal content are of course most desirable.

US 5523386 discloses foam-supported double metal cyanide (DMC) catalysts are disclosed as useful catalysts for epoxide polymerization. Polyurethane foam-supported catalysts of the invention are more active and show reduced induction periods compared with conventional powdered DMC catalysts. The catalysts of the invention can be recovered from the epoxide polymer products and can be reused to catalyze additional epoxide polymerizations.

The reference relates to catalysts useful for epoxide polymerization. In particular, the reference relates to double metal cyanide (DMC) catalysts that are supported on a foamed solid. The foam-supported catalysts are especially useful for preparing polyether polyols having low unsaturation.

The reference acknowledges that double metal cyanide (DMC) compounds are well known catalysts for epoxide polymerization. The catalysts are highly active, and give polyether polyols that have low unsaturation compared with similar polyols made using conventional base catalysis. Conventional DMC catalysts are prepared by reacting aqueous solutions of metal salts and metal cyanide salts to form a precipitate of the DMC compound. The catalysts can be used to make a variety of polymer products including polyether, polyester, and polyetherester polyols. Many of the polyols are useful in various polyurethane coatings, elastomers, sealants, foams, and adhesives.

The reference discloses an improved catalyst in that it is an epoxide polymerization catalyst. The catalyst comprises a double metal cyanide (DMC) catalyst supported on a

foamed solid. Preferably, the foam is one that can be synthesized in the presence of the catalyst, e.g., a synthetic plastic foam. Particularly preferred is polyurethane.

The reference includes a process for making the foam-supported catalyst. The process comprises preparing the foam in the presence of the DMC catalyst. Where the foam is polyurethane, the process comprises preparing a foam from a polyol, a polyisocyanate, water, a surfactant, a foaming catalyst, and a DMC catalyst. The foam is easily prepared according to methods already well known in the art, except that a DMC catalyst is included in the foam formulation. The resulting polyurethane foam, which contains a supported DMC catalyst, is useful as an epoxide polymerization catalyst. The reference also includes a process for making a polyether polyol. This process comprises polymerizing an epoxide in the presence of the foam-supported DMC catalyst. Polyether polyols made with polyurethane foam-supported catalysts of the reference contain unusually low levels of low molecular weight polyol impurities.

The polyurethane foam-supported catalysts are easily prepared and have superior activity for epoxide polymerizations. In addition, the foam-supported catalyst of the reference can be isolated from the polyether polyol product following polyol synthesis, and can be reused as a catalyst for another epoxide polymerization.

The catalyst comprises a double metal cyanide (DMC) catalyst supported on a foam. As defined in the reference, a "double metal cyanide catalyst" or "DMC catalyst" is any DMC compound or complex that will actively polymerize an epoxide when used without a catalyst support, i.e., in powder form. Specifically included, and described in more detail below, are: (1) conventional DMC catalysts, (2) substantially amorphous DMC complexes and compounds, (3) solid DMC catalysts that include a polyether as part of the DMC catalyst, and (4) crystalline DMC complexes prepared using only a slight excess of metal halide salt.

Suitable polyethers for making the polyether-containing DMC catalysts of the

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reference include those produced by ring-opening polymerization of cyclic ethers, and include epoxide polymers, oxetane polymers, tetrahydrofuran polymers, and the like. Any method of catalysis can be used to make the polyethers. The polyethers can have any desired end groups, including, for example, hydroxyl, amine, ester, ether, or the like. Preferred polyethers are not miscible with water. Preferred polyethers are polyether polyols having average hydroxyl functionalities from about 2 to about 8 and number average molecular weights within the range of about 1000 to about 10,000, more preferably from about 1000 to about 5000.

Useful double metal cyanide catalysts include certain crystalline forms of DMC complexes. These complexes are prepared using only a slight excess of metal halide salt so that the catalyst appears substantially crystalline by powder X-ray diffraction analysis, but also has good activity for epoxide polymerization. Another way to make the crystalline yet active catalysts is to use more than a slight excess of the metal halide salt, and then wash the catalyst well during preparation in a manner effective to leave behind in the DMC catalyst only a slight excess of the metal halide salt.

A solvent is optionally included in making polyether polyols by the process of the reference. Suitable solvents are those in which the epoxide and hydroxyl grouping starter are soluble, and which do not deactivate the double metal cyanide catalyst. Preferred solvents include aliphatic and aromatic hydrocarbons, ethers, ketones, and esters. A solvent is not usually necessary, however, and it is often preferred for economic reasons to make the polyethers in the absence of a solvent.

A fixed-bed catalyst system suitable for a continuous process is conveniently made by foaming the DMC catalyst-containing polyurethane mixture in place in a column. Epoxide and starter polyol can then be passed through the column at the desired reaction temperature under conditions effective to produce a polymer product that has the desired molecular weight.

Polyether polyols made with polyurethane foam-supported catalysts of the invention contain an unusually low level of low molecular weight polyol impurities. When a conventional powdered catalyst is used (glyme complexing agent), the polyol product typically contains up to about 5-10 weight percent of a low molecular weight polyol impurity, as is evident from gel-permeation chromatography analysis of the product. Surprisingly, polyols made from a foam-supported catalyst of the invention (in which glyme is used to make the powdered catalyst) do not contain detectable levels of low molecular weight polyol impurities.

Claims 1-19, 30-40 are rejected under 35 U.S.C. 102(b) as being anticipated by USP 6362126 see abstract and claim 1; or EP 0589635 see abstract; DE 19953546 see abst. Act..

USP 6362126 discloses a process for the preparation of a double-metal cyanide catalyst, which comprises reacting a solution of a metal salt of the formula

$M_1^m (X)_n$ where

M_1 is a metal ion selected from the group consisting of Zn^{2+} , Fe^{2+} , Co^{3+} , Ni^{2+} , Mn^{2+} , Co^{2+} , Sn^{2+} , Pb^{2+} , Mo^{4+} , Mo^{6+} , Al^{3+} , V^{4+} , V^{5+} , Sr^{2+} , W^{4+} , W^{6+} , Cr^{2+} , Cr^{3+} and Cd^{2+} ,

X is an anion selected from the group consisting of halide, hydroxide, sulfate, carbonate, cyanide, thiocyanate, isocyanate, cyanate, carboxylate, oxalate and nitrate, and

m and n are selected such that the compound is electrically neutral, with a solution of a cyanometallate compound of the formula:

$H_a M_2 (CN)_b (A)_c$

where H is a hydrogen ion,

M_2 is a metal ion selected from the group consisting of Fe^{2+} , Fe^{3+} , Co^{2+} , Co^{3+} , Mn^{2+} , Mn^{3+} , V^{4+} , V^{5+} , Cr^{2+} , Cr^{3+} , Rh^{3+} , Ru^{2+} and Ir^{3+} and M_1 and M_2 are identical or different,

A is an anion selected from the group consisting of halide, hydroxide, sulfate, carbonate, cyanide, thiocyanate, isocyanate, cyanate, carboxylate, oxalate and nitrate, where A and X may be identical or different, and

a, b, c are selected such that the compound is electrically neutral, where at least one of the two solutions contains a water-soluble ligand selected from the group consisting of alcohols, aldehydes, ketones, ethers, polyethers, esters, ureas, amides, nitriles and sulfides, or this ligand is added after the two solutions are combined, wherein the reaction is carried out in the presence of a solid, inert, unfoamed support or the suspension formed after the starting materials have been combined is applied to a solid, inert, unfoamed support and the solvent is removed, or the double-metal cyanide is separated from the solution, worked up if necessary, resuspended and applied to a solid, inert, unfoamed support.

EP 0589635 discloses a polyether polyol (I) containing residues of double metal cyanide catalyst (II) is combined with a 1-6C aliphatic alcohol and a chelating agent (III), resulting in formation of an insoluble complex of the catalyst residues which is removed from (I) by filtration. (III) is ethylenediaminetetraacetic acid (EDTA), or a salt thereof containing one or more cations selected from Li, Na, K, Mg, Ca, NH₄ and Fe; and wt. ratio (I):alcohol = 1-100:1 (pref. 2-10:1).

The use of (II) in the preparation of (I), particularly those having high functionality, is well known. The reference provides a simple, reliable, commercially practical and economical process for removing the catalyst residues from the polyol, which is necessary if long-term stability and consistent performance in urethane formulations is to be achieved. By using an

amount of alcohol in the specified range, the process also removes any cations introduced with (III) and eliminates the need for subsequent ion-exchange treatment.

Specifically, the reference discloses a process for purifying a polyether prepared using a double metal cyanide catalyst, said process comprising (a) combining a polyether polyol that contains double metal cyanide catalyst residues with a 1-6C aliphatic alcohol and a chelating agent which forms an insoluble complex with the catalyst residues; and (b) filtering the resulting mixture to remove the insoluble complex from the polyol; wherein the relative weight ratio of the polyether polyol to the 1-6C aliphatic alcohol is within the range of about 1:1 to 100:1.

The reference **DE 19953546** discloses double metal cyanide catalysts containing, in addition to (a) double metal cyanides and (b) organic ligands, (c) 2 or more complex-formers other than (b) comprising functionalized polymers such as polyethers or polyacrylamide (26 types listed) or compounds such as glycidyl ethers, cyclodextrins, gallic acid or phosphorus compounds (11 types listed).

The double metal cyanide (DMC) catalyst containing (a) DMC compound(s), (b) organic complex ligand(s) other than (c), (c) two or more complex-forming components (other than b) comprising functionalized polymers selected from polyethers, polyesters, polycarbonates, polyalkylene glycol sorbitan esters, polyalkylene glycol glycidyl ethers, polyacrylamide, acrylamide-acrylic acid copolymers, polyacrylic acid, acrylic acid-maleic acid copolymers, polyacrylonitrile, poly(meth)acrylates, poly-vinyl methyl ether,

poly-vinyl ethyl ether, polyvinyl acetate, polyvinyl alcohol, poly-(N-vinylpyrrolidone), N-vinylpyrrolidone-acrylic acid copolymers, poly-vinyl methyl ketone, poly-(4-vinylphenol), acrylic acid-styrene copolymers, oxazoline polymers, polyalkylene-imines, maleic acid or anhydride copolymers, hydroxyethylcellulose and polyacetals, or glycidyl ethers, glycosides, carboxylate esters of polyhydric alcohols, gallic acids and their salts, esters or amides, cyclodextrins, phosphorus compounds, alpha, beta-unsaturated carboxylate esters and ionic surface-active or interfacially active compounds.

The polyether-polyols by polyaddition of alkylene oxides may be used to starter compounds with active hydrogen atoms. The polyols obtained are used for the production of polyurethanes.

The advantage of the product is the improved double metal cyanide catalysts with greatly increased activity, enabling shorter alkoxylation times and more economical production of polyether-polyols (ideally using so little catalyst that the product can be used directly for the production of polyurethane without removing catalyst residues).

Each of the references discloses a polyol in the presence of a double metal cyanide catalyst prepared from the same components as claimed by applicants. The recited "forming, adding, reacting....,....removing..etc..... is functional language and does not clearly set forth definitive process steps that would distinguish the claims from that of the prior art because it is not supported by further recitations in the claim(s) of sufficient structure to accomplish the function. Note further that a process should at least recite a

positive, active steps and procedures as well as any process parameters necessitated by the specification so that the claim will "clearly set out and circumscribe a particular area with a reasonable degree of precision and particularity, In re Moore, 169 USPQ 236, and make it clear what subject matter the claim encompasses, as well as make clear the subject matter from others would be precluded. In re Hammack 166 USPQ 204. With regard to **USP 5523386**, although the reference does not use the specific term "agglomerate, it does discloses the formation of a "solid cake" which may be interpreted as an agglomeration. Since the disclosed amount of catalyst, ranges etc, are expressed differently , they nevertheless appear to overlap those claimed and thus are not distinguishable over the prior art. With regard to the molecular weights, in **USP 5523386**, the molecular weight of the polyether is disclosed preferably has a number average molecular weight greater than 500, and not the absorbent. In **USP 5688861** it is the polymer product that is disclosed with regard to the molecular weight. Note that the reference states in one of the examples " additional propylene oxide, optionally in conjunction with other alkylene oxide, is then added until the desired molecular weight is achieved." Thus, any properties or characteristics inherent in the prior art, e.g. polymeric acids employed as adsorbent agents, although unobserved, unmentioned or detected by the reference, would still anticipate the claimed invention. Note In re Swinehart, 169 USPQ 226. "It is elementary that the mere recitation of a newly discovered...property, inherently possessed by things in the prior art, does not cause claim drawn to those things ". Nevertheless, in **USP 5688861** the reference does disclose that polymerization catalyst is preferably a free radical polymerization initiator

such as an azobisisalkylnitrile, for example azobis(isobutyronitrile) (AIBN), azobis(4-cyanovaleric acid), azobis(dimethylvaleronitrile), preferably AIBN; peroxy compounds, for example, peroxyesters and peroxyketones, and the like. It also discloses that redox polymerization initiators may also be used. The acids such as cyanovaleric acid may be used or behave as an adsorbent since it is known that organic adsorbents include cation-exchange resins and the like.

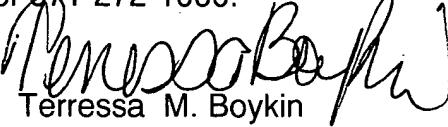
In view of the above, there appears to be no significant difference between the reference(s) and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terressa M. Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday-Thursday 10-5:30 Friday (work at home).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Terressa M. Boykin
Primary Examiner
Art Unit 1711
